

## Predicting Out-Of-Office Blood Pressure (Proof-BP) in the clinic for the diagnosis of hypertension in primary care

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## **ONLINE SUPPLEMENT**

### **PREDICTING OUT-OF-OFFICE BLOOD PRESSURE (PROOF-BP) IN THE CLINIC FOR THE DIAGNOSIS OF HYPERTENSION IN PRIMARY CARE: AN ECONOMIC EVALUATION**

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## Supplemental Material

### Contents

1. Extended methods on costs
2. References
3. Table S1. Factors included the PROOF-BP diagnostic algorithm
4. Table S2 PROOF-BP risk algorithm test characteristics
5. Table S3. Cohort split of 1000 patients with a clinic BP  $\geq 130/80$ mm Hg
6. Table S4. Cohort split of 1000 patients with a clinic BP  $\geq 120/70$ mm Hg
7. Table S5 Cohort split of 1000 patients with a clinic BP  $\geq 140/90$ mm Hg
8. Table S6: Initial misdiagnosis (including those with Masked Hypertension) per 1000 people with a clinic BP of 130/80mm Hg and above
9. Table S7 Detailed breakdown of costs and events for Male Cohorts
10. Table S8 Detailed breakdown of costs and events for Female Cohorts
11. Table S9 Number of Ambulatory Monitoring Investigations by PROOF-BP algorithm vs standard NICE ABPM strategy
12. Table S10 Sensitivity Analysis: Model entry restricted to clinic BP  $\geq 120/70$ mm Hg results
13. Table S11 Sensitivity Analysis: Model entry restricted to clinic BP  $\geq 140/90$ mm Hg results

## Extended methods on costs

Depreciation of equipment costs was addressed by assuming a five year lifetime with no salvage value, and the standard 3.5% annual discount rate. Antihypertensive treatment comprised drug costs and an annual clinical review. Drug therapy costs were calculated using the British National Formulary prices<sup>1</sup> of the commonest generic drugs in each class (Ramipril, Amlodipine, Indapamide) weighted by the number of antihypertensive drugs individuals were on from the Health Survey for England.<sup>2</sup>

An individual surviving an acute cardiovascular event entailed permanent quality of life reduction, increased costs and higher mortality risk with respect to the cardiovascular event experienced. The acute cost of a myocardial infarction (MI) is taken from a modelling study by Palmer and colleagues. Post MI costs were based on an updated cost taken from Taylor and colleagues.<sup>3</sup> The cost of an unstable angina event and costs post event were assumed to be 60% of the costs of MI. The cost of a stable angina event was assumed to consist of an outpatient cardiology assessment plus non-invasive imaging as a typical package of care.<sup>4</sup> Post stable angina costs comprised drugs based on relevant NICE guidance.<sup>1,5,6</sup>

The cost of a Transient Ischaemic Attack (TIA) event is taken from a Lipids Health Technology Assessment report and consisted of tests and procedures from patients being assessed in outpatient clinics.<sup>7</sup> Drug costs were included in the acute event based on recommended treatments based on NICE guidelines.<sup>1,6,8</sup> Post-TIA only the cost of drugs was applied. The initial cost of stroke and post-event costs applied in the model was based on a UK study that looked at the cost of stroke over five years.<sup>9</sup>

The costs and consequences of individuals with an earlier diagnosis and treatment in the HBPM, ABPM and PROOF-BP compared to CBPM were taken into account.

## References

1. Joint Formulary Committee. *British National Formulary 69th Ed.* London: BMJ Group and Pharmaceutical Press; 2015.
2. NatCen Social Research and University College London. Department of Epidemiology and Public Health, Health Survey for England, 2013 [computer file]. Colchester, Essex: UK Data Archive; 2015.
3. Taylor M, Scuffham PA, Chaplin S, Papo NL. An Economic Evaluation of Valsartan for Post-MI Patients in the UK Who Are Not Suitable for Treatment with ACE Inhibitors. *Value in health*. 2009;12:459-465.
4. Department of Health. NHS reference costs 2013/2014. 2014; <https://www.gov.uk/government/publications/nhs-reference-costs-2013-to-2014>, 2015.
5. National Institute for Health and Care Excellence. *Management of Stable Angina* London: NICE; 2011.
6. National Institute for Health and Care Excellence. *Lipid Modification: Cardiovascular Risk Assessment and the Modification of Blood Lipids for the Primary and Secondary Prevention of Cardiovascular Disease*. London: NICE; 2014.
7. Ward S, Lloyd Jones M, Pandor A, Holmes M, Ara R, Ryan A, Yeo W, Payne N. A systematic review and economic evaluation of statins for the prevention of coronary events. *Health technology assessment (Winchester, England)*. 2007;11:1-160, iii-iv.
8. National Institute for Health and Clinical Excellence. *Clopidogrel and Modified-Release Dipyridamole for the Prevention of Occlusive Vascular Events: Review of NICE Technology Appraisal Guidance 90*. London: NICE; 2010.
9. Luengo-Fernandez R, Gray AM, Rothwell PM. A population-based study of hospital care costs during 5 years after transient ischemic attack and stroke. *Stroke*. 2012;43:3343-3351.

Table S1. Factors included the PROOF-BP diagnostic algorithm

Factors	Definition	Algorithm	
		Out-of-office sBP	Out-of-office dBP
<b>Age</b>	Years since birth	✓	✓
<b>Sex</b>	Male or female	✓	✓
<b>Clinic sBP</b>	1 <sup>st</sup> clinic reading	✓	✓
<b>sBP change</b>	Difference between the 1 <sup>st</sup> and third consecutive clinic readings	✓	✓
<b>Pulse pressure</b>	Difference between systolic and diastolic pressure (1 <sup>st</sup> clinic reading)	✓	✓
<b>BMI</b>	Weight divided by height (squared)	✓	✓
<b>Diagnosis of hypertension</b>	Previously recorded as hypertensive	✓	✓
<b>Duration of hypertension</b>	Time since first diagnosis in years	✓	
<b>Antihypertensive prescription</b>	Any currently prescribed antihypertensive medication	✓	✓
<b>History of Cardiovascular disease</b>	Cerebrovascular disease, MI, coronary heart disease, peripheral vascular disease or heart failure		✓

sBP= systolic Blood Pressure. dBP=diastolic Blood Pressure. BMI= Body Mass Index.

MI=Myocardial Infarction.

The full algorithm is available online as an interactive calculator here:

<https://sentry.phc.ox.ac.uk/proof-bp>

Table S2 PROOF-BP risk algorithm test characteristics

Test Characteristics	Adjusted clinic BP < 130/80mm Hg	Adjusted clinic BP between 130/80mm Hg & 144/89mm Hg	Adjusted clinic BP ≥ 145/90mm Hg
Screening Clinic BP ≥ 140/90mm Hg			
False Negative (masked hypertension)	0	0	0
False Positive (white coat hypertension)	0	0	40
True Negative (normotension)	0	76	0
True Positive (sustained hypertension)	0	209	304
Screening Clinic BP between 130/80mm Hg & 140/90mm Hg			
False Negative (masked hypertension)	5	0	0
False Positive (white coat hypertension)	0	0	5
True Negative (normotension)	17	108	0
True Positive (sustained hypertension)	0	165	13
Screening Clinic BP between 120/70mm Hg & 140/90mm Hg			
False Negative (masked hypertension)	24	0	0
False Positive (white coat hypertension)	0	0	5
True Negative (normotension)	42	158	0
True Positive (sustained hypertension)	0	191	13

Table S3. Cohort split of 1000 patients with a clinic BP  $\geq$  130/80 mm Hg

Patients screening clinic BP by age and gender				PROOF-BP risk algorithm		
Age	Sex	Clinic BP $\geq$ 140/90 mm Hg	Clinic BP between 130/80 mm Hg & 140/90 mm Hg	Ignored (adjusted clinic BP <130/80 mm Hg)	Put on ABPM (adjusted clinic BP between 130/80 mm Hg & 144/89 mm Hg)	Offered Treatment (adjusted clinic BP $\geq$ 145/90 mm Hg)
40	Male	586	414	38	695	267
50	Male	680	320	32	637	331
60	Male	763	237	24	596	380
70	Male	849	151	16	564	420
75	Male	895	105	11	534	455
40	Female	620	380	44	699	257
50	Female	659	341	39	669	292
60	Female	847	153	16	596	388
70	Female	821	179	19	572	409
75	Female	943	57	6	528	466

PROOF-BP=Predicting out-of-office blood pressure; ABPM=Ambulatory BP monitoring

Table S4. Cohort split of 1000 patients with a clinic BP  $\geq$  120/70mm Hg

Patients screening clinic BP by age and gender				PROOF-BP risk algorithm		
Age	Sex	Clinic BP $\geq$ 140/90mm Hg	Clinic BP between 130/80mm Hg & 140/90mm Hg	Ignored (adjusted clinic BP <130/80mm Hg)	Put on ABPM (adjusted clinic BP between 130/80mm Hg & 144/89mm Hg)	Offered Treatment (adjusted clinic BP $\geq$ 145/90mm Hg)
40	Male	167	833	77	811	112
50	Male	115	885	93	793	114
60	Male	281	719	76	744	179
70	Male	186	814	90	754	156
75	Male	358	642	69	707	224
40	Female	267	733	83	788	129
50	Female	391	609	66	757	177
60	Female	398	602	59	746	194
70	Female	449	551	56	706	238
75	Female	391	609	64	716	220

PROOF-BP=Predicting out-of-office blood pressure; ABPM=Ambulatory BP monitoring

Table S5. Cohort split of 1000 patients with a clinic BP  $\geq$  140/90mm Hg

Patients screening clinic BP by age and gender				PROOF-BP risk algorithm		
Age	Sex	Clinic BP $\geq$ 140/90mm Hg	Clinic BP <140/90mm Hg	Ignored (adjusted clinic BP <130/80mm Hg)	Put on ABPM (adjusted clinic BP between 130/80mm Hg & 144/89mm Hg)	Offered Treatment (adjusted clinic BP $\geq$ 145/90mm Hg)
40	Male	1000	0	0	580	420
50	Male	1000	0	0	536	464
60	Male	1000	0	0	517	483
70	Male	1000	0	0	513	487
75	Male	1000	0	0	497	503
40	Female	1000	0	0	612	388
50	Female	1000	0	0	580	420
60	Female	1000	0	0	551	449
70	Female	1000	0	0	512	488
75	Female	1000	0	0	509	491

PROOF-BP=Predicting out-of-office blood pressure; ABPM=Ambulatory BP monitoring

Table S6: Initial misdiagnosis (including those with Masked Hypertension) per 1000 people with a clinic BP of 130/80mm Hg and above

False negatives		False positives		False negatives		False positives			
Strategy	Clinic BP between 130/80-140/90mm Hg	Clinic BP >140/90mm Hg	Clinic BP between 130/80-140/90mm Hg	Clinic BP >140/90mm Hg	Strategy	Clinic BP between 130/80-140/90mm Hg	Clinic BP >140/90mm Hg	Clinic BP between 130/80-140/90mm Hg	Clinic BP >140/90mm Hg
40 years , Male					40 years , Female				
CBPM	151	26	0	220	CBPM	52	15	0	277
HBPM	151	25	0	153	HBPM	52	15	0	192
ABPM	151	1	0	11	ABPM	52	1	0	14
PROOF-BP	7	1	2	56	PROOF-BP	3	0	2	70
50 years, Male					50 years, Female				
CBPM	96	47	0	191	CBPM	54	29	0	247
HBPM	96	46	0	133	HBPM	54	29	0	172
ABPM	96	2	0	10	ABPM	54	1	0	12
PROOF-BP	5	1	1	48	PROOF-BP	3	1	2	62
60 years, Male					60 years, Female				
CBPM	63	61	0	183	CBPM	39	51	0	265
HBPM	63	60	0	127	HBPM	39	51	0	184
ABPM	63	3	0	9	ABPM	39	3	0	13
PROOF-BP	3	1	1	46	PROOF-BP	2	1	1	67
70 years, Male					70 years, Female				
CBPM	39	69	0	195	CBPM	45	68	0	186
HBPM	39	69	0	135	HBPM	45	68	0	129
ABPM	39	3	0	10	ABPM	45	3	0	9
PROOF-BP	2	1	1	49	PROOF-BP	2	1	1	47
75 years , Male					75 years , Female				
CBPM	27	81	0	174	CBPM	79	14	0	208
HBPM	27	80	0	121	HBPM	79	14	0	144
ABPM	27	4	0	9	ABPM	4	14	0	10
PROOF-BP	1	2	1	44	PROOF-BP	2	1	0	52
CBPM= Clinic Blood Pressure Monitoring. HBPM= Home Blood Pressure monitoring. ABPM= Ambulatory Blood Pressure Monitoring. PROOF-BP=Predicting out-of-office blood pressure.									



Table S7 Detailed breakdown of costs and events for Male Cohorts

Strategy	Cardiovascular events					Life Years					Costs					
	MI	UA	SA	Stroke	TIA	Life years	QALYS	Diagnosis	Treatment	NT Check-ups	MI	UA	SA	Stroke	TIA	Costs
40 years, Male																
CBPM	124	54	161	81	27	43.309	43.309	£53	£2,026	£71	£3,268	£815	£180	£2,631	£71	£9,115
HBPM	124	54	161	81	27	43.309	43.309	£65	£1,964	£79	£3,269	£815	£180	£2,630	£71	£9,073
ABPM	124	54	161	81	27	43.310	43.310	£153	£1,619	£116	£3,267	£814	£180	£2,627	£71	£8,846
PROOF-BP	121	53	158	80	26	43.350	43.350	£123	£2,068	£69	£3,170	£793	£175	£2,545	£69	£9,010
50 years, Male																
CBPM	111	50	151	82	26	34.268	26.942	£51	£1,669	£50	£2,566	£673	£156	£2,492	£66	£7,903
HBPM	111	50	151	82	26	34.268	26.943	£61	£1,620	£56	£2,564	£673	£156	£2,491	£66	£7,870
ABPM	110	50	151	82	26	34.271	26.951	£126	£1,373	£81	£2,556	£671	£155	£2,484	£65	£7,709
PROOF-BP	109	49	148	80	26	34.301	27.014	£100	£1,664	£52	£2,500	£658	£152	£2,417	£63	£7,764
60 years, Male																
CBPM	94	45	125	80	24	25.485	19.854	£52	£1,277	£33	£1,814	£513	£112	£2,171	£54	£6,177
HBPM	94	45	124	80	24	25.486	19.856	£60	£1,234	£39	£1,812	£513	£112	£2,168	£54	£6,147
ABPM	94	45	124	80	24	25.492	19.868	£112	£1,046	£56	£1,804	£511	£112	£2,155	£53	£6,018
PROOF-BP	93	44	122	79	23	25.511	19.903	£83	£1,229	£39	£1,777	£504	£110	£2,110	£52	£6,036
70 years, Male																
CBPM	75	37	91	73	19	17.488	13.583	£53	£896	£20	£1,176	£349	£68	£1,673	£37	£4,355
HBPM	75	37	90	73	19	17.489	13.586	£60	£859	£25	£1,174	£348	£68	£1,669	£37	£4,328
ABPM	75	37	90	72	19	17.496	13.599	£103	£718	£37	£1,164	£346	£67	£1,651	£36	£4,237
PROOF-BP	74	37	89	71	19	17.504	13.613	£68	£823	£28	£1,152	£342	£67	£1,627	£36	£4,229
75 years, Male																
CBPM	65	32	77	71	17	14.008	10.814	£53	£735	£14	£893	£270	£53	£1,492	£29	£3,581
HBPM	64	32	76	71	17	14.010	10.817	£59	£708	£17	£890	£269	£53	£1,486	£29	£3,558
ABPM	64	32	76	70	16	14.015	10.829	£92	£615	£25	£880	£266	£52	£1,466	£29	£3,484
PROOF-BP	63	32	75	69	16	14.019	10.836	£57	£682	£20	£873	£264	£52	£1,451	£29	£3,476

CBPM= Clinic Blood Pressure Monitoring. HBPM= Home Blood Pressure monitoring. ABPM= Ambulatory Blood Pressure Monitoring. PROOF-BP=Predicting out-of-office blood pressure. MI= Myocardial infarction.  
 UA= Unstable Angina. SA=Stable Angina.TIA= Transient Ischaemic Attack. QALY= Quality Adjusted Life Year. NT Check-ups = BP check-ups for those without a hypertension diagnosis

Table S8 Detailed breakdown of costs and events for Female Cohorts

Strategy	Cardiovascular events					Life Years					Costs					
	MI	UA	SA	Stroke	TIA	Life years	QALYS	Diagnosis	Treatment	NT Check-ups	MI	UA	SA	Stroke	TIA	Costs
40 years, Female																
CBPM	46	26	103	85	21	44.002	34.543	£58	£1,885	£85	£997	£421	£112	£2,473	£53	£6,083
HBPM	46	26	103	85	21	44.002	34.543	£74	£1,802	£95	£997	£422	£112	£2,473	£53	£6,028
ABPM	46	27	104	85	21	44.000	34.540	£190	£1,342	£146	£999	£423	£112	£2,475	£53	£5,741
PROOF-BP	45	26	101	83	21	44.020	34.583	£150	£1,838	£92	£978	£412	£110	£2,401	£52	£6,032
50 years, Female																
CBPM	45	23	96	85	20	34.856	26.634	£55	£1,537	£62	£927	£333	£98	£2,407	£47	£5,466
HBPM	45	23	96	85	20	34.856	26.634	£68	£1,473	£70	£927	£333	£98	£2,408	£47	£5,423
ABPM	45	23	96	85	20	34.856	26.634	£151	£1,158	£104	£928	£332	£98	£2,407	£47	£5,224
PROOF-BP	44	23	94	83	19	34.874	26.672	£121	£1,494	£69	£908	£324	£95	£2,335	£45	£5,391
60 years, Female																
CBPM	41	17	74	82	17	25.899	19.364	£60	£1,291	£30	£755	£206	£66	£2,129	£37	£4,575
HBPM	41	17	74	82	17	25.899	19.364	£72	£1,229	£38	£755	£206	£66	£2,129	£37	£4,532
ABPM	41	17	74	81	17	25.901	19.368	£146	£955	£66	£754	£206	£66	£2,123	£37	£4,350
PROOF-BP	41	17	73	80	17	25.910	19.385	£91	£1,145	£46	£744	£203	£65	£2,085	£36	£4,415
70 years, Female																
CBPM	33	12	50	73	15	17.700	12.949	£53	£840	£24	£509	£112	£38	£1,643	£28	£3,246
HBPM	33	12	50	73	15	17.701	12.951	£60	£804	£28	£508	£112	£38	£1,639	£28	£3,217
ABPM	33	12	50	72	15	17.706	12.958	£103	£668	£41	£504	£111	£37	£1,623	£28	£3,115
PROOF-BP	33	12	49	71	15	17.712	12.970	£71	£783	£30	£497	£109	£37	£1,594	£27	£3,148
75 years, Female																
CBPM	28	9	41	67	14	14.153	10.141	£57	£726	£13	£383	£77	£28	£1,378	£25	£2,686
HBPM	28	9	41	67	14	14.154	10.142	£64	£691	£18	£382	£76	£28	£1,373	£25	£2,658
ABPM	28	9	41	66	14	14.158	10.149	£104	£574	£28	£378	£76	£28	£1,356	£24	£2,568
PROOF-BP	28	9	40	66	14	14.159	10.152	£59	£641	£22	£376	£75	£28	£1,348	£24	£2,572

CBPM= Clinic Blood Pressure Monitoring. HBPM= Home Blood Pressure monitoring. ABPM= Ambulatory Blood Pressure Monitoring. PROOF-BP=Predicting out-of-office blood pressure. MI= Myocardial infarction. UA= Unstable Angina. SA=Stable Angina.TIA= Transient Ischaemic Attack. QALY= Quality Adjusted Life Year. NT Check-ups = BP check-ups for those without a hypertension diagnosis

Table S9 Number of Ambulatory Monitoring Investigations by PROOF-BP algorithm vs standard NICE ABPM strategy						
Screening clinic BP ≥130/80mm Hg						
Hg	PROOF BP	ABPM strategy	Difference	Masked Hypertension cases	Sustained Hypertension cases	Underlying prevalence of Hypertension'
40 years, Male	695	586	109	152	178	330
50 years, Male	637	680	-43	97	326	423
60 years, Male	596	763	-167	63	424	488
70 years, Male	564	849	-285	40	486	526
75 years, Male	534	895	-361	28	570	598
40 years, Female	699	620	79	53	107	160
50 years, Female	669	659	10	54	201	255
60 years, Female	596	847	-251	39	357	396
70 years, Female	572	821	-249	45	476	521
75 years, Female	528	943	-415	14	557	571
Screening clinic BP ≥120/70mm Hg						
Hg	PROOF BP	ABPM strategy	Difference	Masked Hypertension cases	Sustained Hypertension cases	Underlying prevalence of Hypertension'
40 years, Male	811	167	644	305	51	356
50 years, Male	793	281	512	218	135	353
60 years, Male	744	358	386	172	199	371
70 years, Male	754	391	363	159	224	384
75 years, Male	707	449	258	144	286	430
40 years, Female	788	115	673	122	20	142
50 years, Female	757	186	571	129	57	185
60 years, Female	746	267	479	188	113	301
70 years, Female	706	398	308	153	231	383
75 years, Female	716	391	325	155	231	385
Screening clinic BP ≥140/90mm Hg						
Hg	PROOF BP	ABPM strategy	Difference	Masked Hypertension cases	Sustained Hypertension cases	Underlying prevalence of Hypertension'
40 years, Male	580	1000	-420	0	304	304
50 years, Male	536	1000	-464	0	480	480
60 years, Male	517	1000	-483	0	556	556
70 years, Male	513	1000	-487	0	573	573
75 years, Male	497	1000	-503	0	637	637
40 years, Female	612	1000	-388	0	173	173
50 years, Female	580	1000	-420	0	305	305
60 years, Female	551	1000	-449	0	421	421
70 years, Female	512	1000	-488	0	579	579
75 years, Female	509	1000	-491	0	590	590

Table S10 Sensitivity Analysis: Model entry restricted to clinic BP  $\geq 120/70$ mm Hg results

Strategy	QALYs (95% CI)	Costs (95% CI)	ICER	Most CE strategy probability	Strategy	QALYs (95% CI)	Costs (95% CI)	ICER	Most CE strategy probability
40 years, Male					40 years, Female				
ABPM	18.084 (17.843 to 18.316)	£3214 (£3119 to £3312)		0%	ABPM	17.986 (17.789 to 18.186)	£1822 (£1742 to £1917)		0%
HBPM	18.079 (17.839 to 18.312)	£3246 (£3154 to £3342)	Dominated	0%	HBPM	17.984 (17.788 to 18.184)	£1846 (£1765 to £1938)	Dominated	0%
CBPM	18.078 (17.836 to 18.311)	£3255 (£3161 to £3349)	Dominated	0%	CBPM	17.983 (17.787 to 18.184)	£1852 (£1773 to £1943)	Dominated	0%
PROOF-BP	18.155 (17.925 to 18.381)	£3395 (£3309 to £3488)	£2521	100%	PROOF-BP	18.016 (17.822 to 18.215)	£2117 (£2031 to £2206)	£9604	100%
50 years, Male					50 years, Female				
ABPM	15.568 (15.309 to 15.805)	£3300 (£3179 to £3432)		0%	ABPM	15.408 (15.180 to 15.629)	£2106 (£1991 to £2239)		0%
HBPM	15.564 (15.304 to 15.801)	£3339 (£3224 to £3462)	Dominated	0%	HBPM	15.406 (15.177 to 15.627)	£2135 (£2025 to £2261)	Dominated	0%
CBPM	15.562 (15.302 to 15.800)	£3350 (£3235 to £3471)	Dominated	0%	CBPM	15.405 (15.177 to 15.627)	£2143 (£2036 to £2267)	Dominated	0%
PROOF-BP	15.632 (15.381 to 15.866)	£3417 (£3311 to £3534)	£1836	100%	PROOF-BP	15.444 (15.217 to 15.661)	£2308 (£2206 to £2421)	£5553	100%
60 years, Male					60 years, Female				
ABPM	12.817 (12.585 to 13.044)	£3046 (£2880 to £3226)		0%	ABPM	12.509 (12.295 to 12.735)	£2173 (£1993 to £2366)		0%
HBPM	12.811 (12.579 to 13.037)	£3085 (£2924 to £3256)	Dominated	0%	HBPM	12.506 (12.291 to 12.733)	£2205 (£2034 to £2394)	Dominated	0%
CBPM	12.810 (12.577 to 13.036)	£3097 (£2941 to £3269)	Dominated	0%	CBPM	12.505 (12.290 to 12.731)	£2214 (£2048 to £2397)	Dominated	0%
PROOF-BP	12.866 (12.640 to 13.091)	£3128 (£2986 to £3290)	£1669	100%	PROOF-BP	12.549 (12.339 to 12.773)	£2299 (£2145 to £2472)	£3184	100%
70 years, Male					70 years, Female				
ABPM	9.809 (9.580 to 10.005)	£2509 (£2281 to £2748)		0%	ABPM	9.352 (9.110 to 9.577)	£1838 (£1608 to £2068)		0%
HBPM	9.804 (9.573 to 10.000)	£2544 (£2323 to £2773)	Dominated	0%	HBPM	9.349 (9.108 to 9.574)	£1868 (£1644 to £2101)	Dominated	0%
CBPM	9.802 (9.571 to 9.999)	£2556 (£2342 to £2785)	Dominated	0%	CBPM	9.348 (9.106 to 9.571)	£1878 (£1655 to £2108)	Dominated	0%
PROOF-BP	9.843 (9.614 to 10.039)	£2563 (£2361 to £2776)	£1582	100%	PROOF-BP	9.374 (9.133 to 9.597)	£1919 (£1711 to £2129)	£3674	100%
75 years, Male					75 years, Female				
ABPM	8.229 (7.964 to 8.468)	£2226 (£1989 to £2481)		0%	ABPM	7.692 (7.411 to 7.939)	£1579 (£1359 to £1840)		0%
HBPM	8.225 (7.958 to 8.464)	£2255 (£2028 to £2511)	Dominated	0%	HBPM	7.690 (7.409 to 7.936)	£1602 (£1389 to £1852)	Dominated	0%
PROOF-BP	8.253 (7.987 to 8.487)	£2264 (£2048 to £2494)	£1674	100%	CBPM	7.689 (7.409 to 7.936)	£1611 (£1399 to £1859)	Dominated	0%
CBPM	8.223 (7.956 to 8.462)	£2265 (£2037 to £2517)	Dominated	0%	PROOF-BP	7.708 (7.425 to 7.956)	£1653 (£1454 to £1895)	£4737	100%

CI=Confidence Interval. CBPM= Clinic Blood Pressure Monitoring. HBPM= Home Blood Pressure monitoring. ABPM= Ambulatory Blood Pressure Monitoring. CE= cost-effective at £20,000 threshold. QALYs= quality-adjusted life years. ICER= Incremental Cost Effectiveness Ratio.

Table S11 Sensitivity Analysis: Model entry restricted to clinic BP ≥ 140/90mm Hg results									
Strategy	QALYs (95% CI)	Costs (95% CI)	ICER	Most CE strategy probability	Strategy	QALYs (95% CI)	Costs (95% CI)	ICER	Most CE strategy probability
40 years, Male					40 years, Female				
ABPM	18.146 (17.907 to 18.378)	£3365 (£3226 to £3583)		0%	ABPM	18.016 (17.813 to 18.207)	£2140 (£2018 to £2337)		89%
PROOF-BP	18.148 (17.909 to 18.381)	£3407 (£3276 to £3598)	£16551	76%	PROOF-BP	18.019 (17.815 to 18.209)	£2202 (£2082 to £2372)	£29771	11%
HBPM	18.147 (17.910 to 18.378)	£3563 (£3440 to £3696)	Dominated	24%	HBPM	18.019 (17.816 to 18.210)	£2389 (£2264 to £2521)	Dominated	0%
CBPM	18.148 (17.910 to 18.380)	£3613 (£3515 to £3727)	Dominated	0%	CBPM	18.020 (17.817 to 18.210)	£2452 (£2351 to £2567)	Dominated	0%
50 years, Male					50 years, Female				
ABPM	15.628 (15.381 to 15.861)	£3524 (£3339 to £3750)		7%	ABPM	15.435 (15.224 to 15.656)	£2422 (£2254 to £2654)		18%
PROOF-BP	15.630 (15.383 to 15.863)	£3539 (£3373 to £3740)	£8269	93%	PROOF-BP	15.437 (15.226 to 15.658)	£2449 (£2290 to £2658)	£14314	82%
HBPM	15.623 (15.378 to 15.857)	£3661 (£3508 to £3825)	Dominated	0%	HBPM	15.436 (15.224 to 15.654)	£2586 (£2438 to £2756)	Dominated	0%
CBPM	15.622 (15.378 to 15.857)	£3696 (£3559 to £3838)	Dominated	0%	CBPM	15.437 (15.224 to 15.658)	£2632 (£2500 to £2785)	Dominated	0%
60 years, Male					60 years, Female				
ABPM	12.850 (12.640 to 13.079)	£3307 (£3077 to £3567)		10%	ABPM	12.527 (12.304 to 12.745)	£2425 (£2204 to £2714)		16%
PROOF-BP	12.852 (12.641 to 13.080)	£3311 (£3110 to £3558)	£3265	90%	PROOF-BP	12.529 (12.305 to 12.746)	£2435 (£2222 to £2707)	£8265	84%
HBPM	12.841 (12.628 to 13.072)	£3417 (£3233 to £3624)	Dominated	0%	HBPM	12.524 (12.304 to 12.739)	£2548 (£2358 to £2788)	Dominated	0%
CBPM	12.839 (12.628 to 13.068)	£3448 (£3279 to £3650)	Dominated	0%	CBPM	12.524 (12.301 to 12.740)	£2586 (£2414 to £2804)	Dominated	0%
70 years, Male					70 years, Female				
PROOF-BP	9.820 (9.592 to 10.043)	£2771 (£2530 to £3064)	Dominant	93%	PROOF-BP	9.349 (9.115 to 9.579)	£2117 (£1870 to £2415)	Dominant	94%
ABPM	9.819 (9.591 to 10.043)	£2777 (£2520 to £3090)	Dominated	7%	ABPM	9.348 (9.114 to 9.578)	£2125 (£1866 to £2434)	Dominated	6%
HBPM	9.809 (9.580 to 10.033)	£2866 (£2638 to £3134)	Dominated	0%	HBPM	9.341 (9.109 to 9.575)	£2204 (£1977 to £2483)	Dominated	0%
CBPM	9.806 (9.577 to 10.027)	£2895 (£2682 to £3154)	Dominated	0%	CBPM	9.340 (9.106 to 9.570)	£2230 (£2003 to £2501)	Dominated	0%
75 years, Male					75 years, Female				
PROOF-BP	8.227 (7.968 to 8.456)	£2498 (£2213 to £2857)	Dominant	98%	PROOF-BP	7.684 (7.424 to 7.931)	£1864 (£1595 to £2206)	Dominant	98%
ABPM	8.227 (7.967 to 8.455)	£2513 (£2224 to £2884)	Dominated	2%	ABPM	7.684 (7.424 to 7.930)	£1877 (£1601 to £2230)	Dominated	2%
HBPM	8.217 (7.955 to 8.446)	£2577 (£2301 to £2921)	Dominated	0%	HBPM	7.679 (7.418 to 7.926)	£1939 (£1685 to £2272)	Dominated	0%
CBPM	8.214 (7.955 to 8.442)	£2599 (£2333 to £2945)	Dominated	0%	CBPM	7.678 (7.418 to 7.925)	£1961 (£1709 to £2280)	Dominated	0%

CI=Confidence Interval. CBPM= Clinic Blood Pressure Monitoring. HBPM= Home Blood Pressure monitoring. ABPM= Ambulatory Blood Pressure Monitoring. CE= cost-effective at £20,000 threshold. QALYs= quality-adjusted life years. ICER= Incremental Cost Effectiveness Ratio.

